Name: $\qquad$ Section: $\qquad$
Answer all questions and show your work. Unsupported answers may receive no credit. You may not use a calculator on this quiz. Allow 15 minutes for the quiz.

1. (4 points) Use the method of cylindrical shells to find the volume generated by rotating the region $R$ bounded by $y=\sqrt{x}, x=0$ and $y=2$, about the $y$-axis.
2. (6 points) Consider the curve $y=x^{3}, 0 \leq x \leq 1$.
(a) (2 points) Express the arc length of the curve as an integral. (Do not evaluate the integral.)
(b) (2 points) We rotate the curve about the $x$-axis to obtain a surface $C$. Express the surface area of $C$ as an integral.
(c) (2 points) Find the exact surface area of $C$.
